Scenarios and Operator Business Models for Management of Digital Homes

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Outline

• Background
• Objectives and methods
• Management of digital homes
• Results
  – Scenarios
  – Business models
• Conclusions
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What is a Digital Home?

- A Digital home comprises **devices** and **network connections**
  - E.g. PCs, set-top boxes, mobile devices, and cameras are connected to a home network
- Changes the provision of services
  - New service categories, e.g. home automation
  - New ways to provide existing services, e.g. content, communication

Technology islands are converging at the digital home

Source: DLNA (2006)
Example: Media Center-Based Digital Home

- **Home Network**
  - Media Center PC
  - Secondary TV screen
  - Laptop
  - Media Extender
  - MP3 player
  - Mobile handset
  - Primary TV screen
  - Hifi System

- **Operator Network**
  - Residential Gateway

- **Internet**
  - Copper, coaxial cable, fiber or wireless access network connection
  - Wireless or wired intra-home connections

- **Intra-home connections**
  - Copper, coaxial cable, fiber or wireless access network connection
Users Need Help with Managing their Digital Homes

• Digital homes are growing complex
  – More devices, content, applications, security issues, subscriptions
  – Too much for the average user

• Someone is needed to handle the management tasks
  – Operators are potential management service providers
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Objectives and Methods

• Research question
  – What business opportunities does management of digital homes offer for operators?

• Objectives
  – Study the role of an operator in relation to other service providers
  – Construct management scenarios
  – Identify possible operator business models

• Research methods
  – Literature study
  – Expert interviews
  – Analysis based on theoretical frameworks
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Complex Management Hierarchy

Layer I

Digital Home Management

Layer II

Public Access Management
User Network Management
Security Management
Installation
Fault Management & Support
Remote Access Management
Home Automation Management
Content & Data Management

Layer III

Devices
Software
Intra-Home Network Elements
Automation Devices
Content
Configuration Data

Layer IV

PCs and Peripherals
Consumer Electronics
Mobile Devices
Operating System
Applications
Device Drivers
Commercial Content
Self-Created Content
Several Potential Managers

- Operators
  - E.g. Elisa, TeliaSonera, Welho
- Software platform companies
  - E.g. Microsoft, Apple
- Security providers
  - E.g. F-Secure, Norton
- Other software application providers
  - E.g. Adobe
- “IT Janitors”
  - E.g. House managing firms, one-man companies
- Media companies
- Friends/relatives
- End-users

- Already send people to homes (e.g. ADSL technicians)
- Have existing charging & billing mechanisms
- Provide security services
- Distribute hardware
Operator Resides Close to End-Users

An operator may approach the home from all three value chains – special role!

VC = Value Chain

Source: Smura (2006), modified
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Trends Shaping the Scenarios

Example figure: Trend weightings in Scenario I

Direction and impact are uncertain

<table>
<thead>
<tr>
<th>Outsourcing digital home management tasks will become more common</th>
</tr>
</thead>
<tbody>
<tr>
<td>More self-management                                      ●</td>
</tr>
<tr>
<td>More outsourced management                                 ○</td>
</tr>
<tr>
<td>Digital home management will be offered in a centralized manner</td>
</tr>
<tr>
<td>Distributed management                                     ○</td>
</tr>
<tr>
<td>Centralized management                                     ●</td>
</tr>
<tr>
<td>Fight for digital home services will intensify</td>
</tr>
<tr>
<td>Operators weak                                             ○</td>
</tr>
<tr>
<td>Operators strong                                           ●</td>
</tr>
<tr>
<td>Software platform firms weak                               ○</td>
</tr>
<tr>
<td>Software platform firms strong                              ●</td>
</tr>
<tr>
<td>Other service providers weak                                ○</td>
</tr>
<tr>
<td>Other service providers strong                               ●</td>
</tr>
<tr>
<td>Users’ trust over firms will change</td>
</tr>
<tr>
<td>Low level of trust                                         ○</td>
</tr>
<tr>
<td>High level of trust                                         ●</td>
</tr>
<tr>
<td>Market concentration in the digital home industry will change</td>
</tr>
<tr>
<td>Many actors                                                 ○</td>
</tr>
<tr>
<td>Few large actors                                            ●</td>
</tr>
<tr>
<td>Consumption habits will change</td>
</tr>
<tr>
<td>More purchased equipment                                    ○</td>
</tr>
<tr>
<td>More leased equipment                                        ●</td>
</tr>
<tr>
<td>Service aggregation will become more common</td>
</tr>
<tr>
<td>Less bundles                                                ○</td>
</tr>
<tr>
<td>More bundles                                                ●</td>
</tr>
<tr>
<td>Regulatory intervention will increase</td>
</tr>
<tr>
<td>Unfavorable for operators                                   ○</td>
</tr>
<tr>
<td>Favorable for operators                                     ●</td>
</tr>
</tbody>
</table>
Scenario I: Locally Centralized

- Large, well-developed management business
- Operators dominate
  - “Best case scenario” for operators
- All-inclusive management offerings
  - Connectivity, devices, security, remote configuration, automatic backups, etc.
  - Little or no self-management
Scenario II: Globally Centralized

- Large, well-developed management business
- Software platform firms dominate
  - “Microsoft homes” vs. “Apple homes” vs. “Open source homes”
- Nearly all-inclusive management offerings
  - Some self-management required
  - E.g. extended Microsoft Update
Scenario III: Global Specialists & Local Janitors

- Separate management services offered by different service providers
- No integrated solution available
  - Self-management required
- Various players with equal power
  - Specialized in security, on-site installation, backups, application updates, etc.
Scenario IV: Do-It-Yourself

- Resembles the current situation
  - Management business not developed
  - Users not willing to pay for management
- Only technologically capable people have home networks
  - Limited overall growth in digital services
  - Substantial device sales, though
- Most self-management required
Possible Operator Business Models

- **Bit-pipe**
  - Only Internet connectivity
- **CPE distribution**
  - Equipment bundled with Internet access
  - Retail or leasing
- **Service intermediary**
  - Broker between 3rd party SPs and consumers
  - No own management offerings
  - Re-branding (e.g. F-Secure software > “Elisa Data Security”)
- **Update aggregator**
  - Gathering 3rd party updates and distributing to homes
- **Total management**
  - All-inclusive
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Conclusions

• Operators have an exceptional role
• Service aggregation will be a important success factor
  – Management services are needed but consumers are not willing to pay
  – Cost of management must be hidden within service bundles
• Equipment provision is tied with management
  – “Owner is the manager”
• Trade-off between ease of use and retaining control
• Topics for future research
  – Remote connectivity and related business models
  – Interconnecting home networks with each other
Questions